CONTAX RTS

Similar models: Yashica FR series (mechanically similar)

Battery: 1 ea. 6V PX28 or 544

Fig. 1 — top cover removed
Fig. 2 — bottom cover and tripod socket removed
Fig. 3 — front plate removed, wind side
Fig. 4 — front plate removed, wind side
Fig. 5 — shutter/mirror-box module, front
Fig. 6 — shutter/mirror-box module, back
Fig. 7 — wiring pictorial and voltage-test points, main amp
Fig. 8 — wiring pictorial, switch amp
Fig. 9 — wiring pictorial, lens-mount terminal board
Fig. 10 — wiring pictorial, rewind-side terminal board
Fig. 11 — wiring pictorial, wind-side terminal board
Fig. 12 — wiring pictorial, lower terminal board and SW7
Fig. 13 — connections for offset adjustment
Fig. 14 — timing, charge cam

lever by turning the nut. The first-curtain lever sits above the first-curtain gear, Fig. 2. In earlier models, you can correct curtain bounce by increasing the strength of the spring inside the curtain-damping cylinder, Fig. 3.
Normally do not disturb: C, D, E, F. Also do not disturb the variable resistor on the underside of the switch-amp board (part of the IC).

ADJUSTMENTS:

Meter readout	A
Auto shutter speeds	B

Note: You can reach the auto speeds and meter adjustments without taking off the top cover; just set to auto and remove the shutter-speed dial.

LED input voltage	C
2.8V constant voltage	D
540mv	E
Offset	F
X sync	G
Release magnet	H
Travel time, first curtain	I
Travel time, second curtain	J
1/2000 second	K

Note: Reach the trigger-switch adjustment for 1/2000 second from inside the mirror box after removing the lens. You do not have to disassemble the camera to adjust the fast speeds.

Alignment, first curtain	L

Note: Later models have an adjustment for the first-curtain brake at the bottom of the camera. Change the pressure on the first-curtain brake lever by turning the nut. The first-curtain lever sits above the first-curtain gear, Fig. 2. In earlier models, you can correct curtain bounce by increasing the strength of the spring inside the curtain-damping cylinder, Fig. 3.
Normally do not disturb: C, D, E, F. Also do not disturb the variable resistor on the underside of the switch-amp board (part of the IC).

Adjustment sequence:

1. auto shutter speeds
2. meter readout
3. manual shutter speeds.

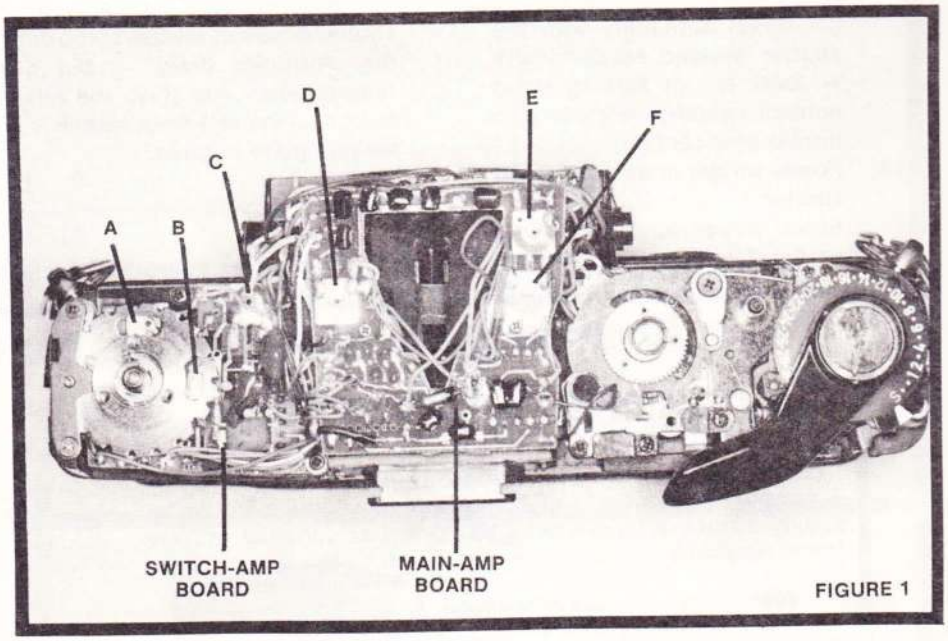


FIGURE 1

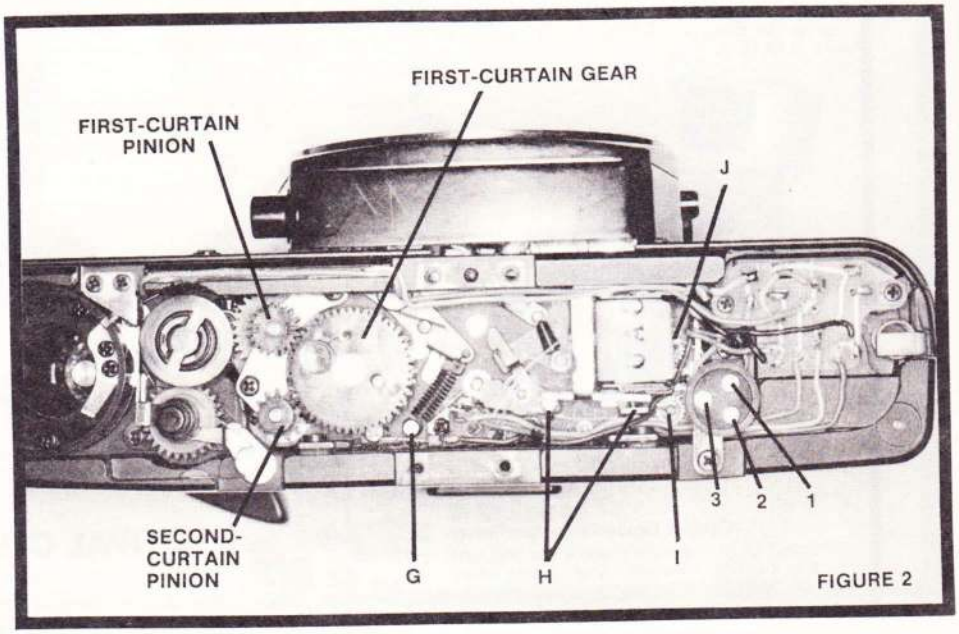


FIGURE 2

Note: The only adjustment for the manual shutter speeds is the eccentric on the trigger switch (1/2000 second). If necessary, you can change the timing capacitor, Fig. 7. A larger capacitance value gives you a slower shutter speed. However, changing the timing capacitor will also affect the auto speeds. Readjust the auto speeds and the meter readout if you change the timing capacitor.

ADJUSTMENT VALUES:

Curtain-travel time: 12ms +0.2,-0.5ms (32mm distance)

Flange-focal distance: 45.65mm (flange to pressure-plate rails)

Memory time lag: 20ms or more (from the time the power switch SW7 closes to the time the memory switch SW10 opens)

Mirror-release magnet: 0.6mm space gap between armature and core. A pressure of 20 grams on the armature should release the mirror. The mirror-release magnet should attract the armature and release the mirror with 2.1V applied across the coil (black wires at lower terminal board, Fig. 12).

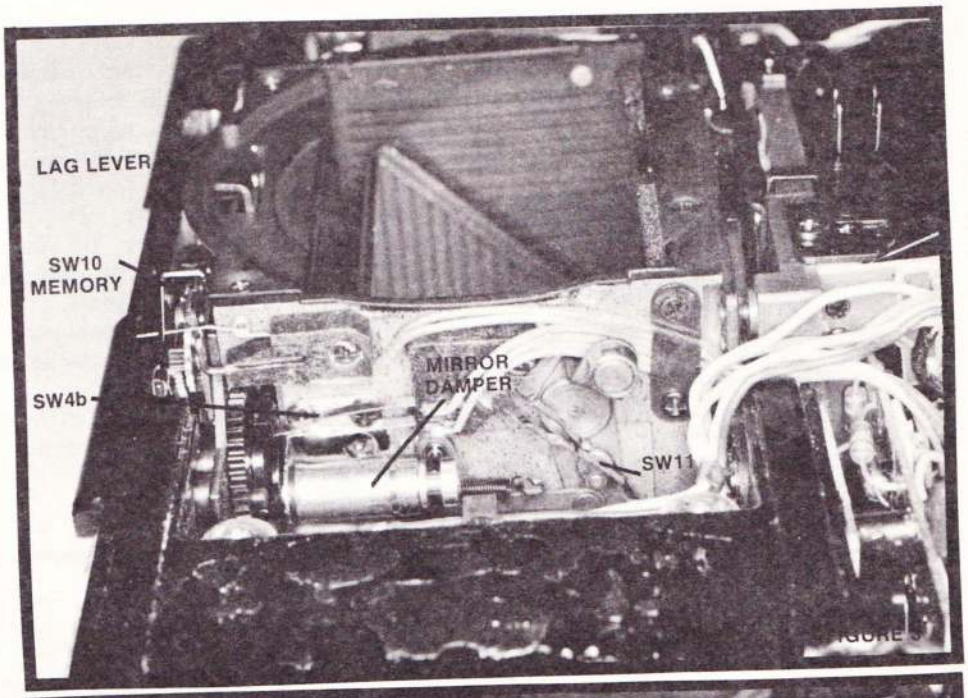
Conditions for voltage tests: make measurements to the negative-line point on the main-amp board, Fig. 7. Exposure-preview switch closed, no lens, ASA 100, auto, 5V supplied to the battery terminals.

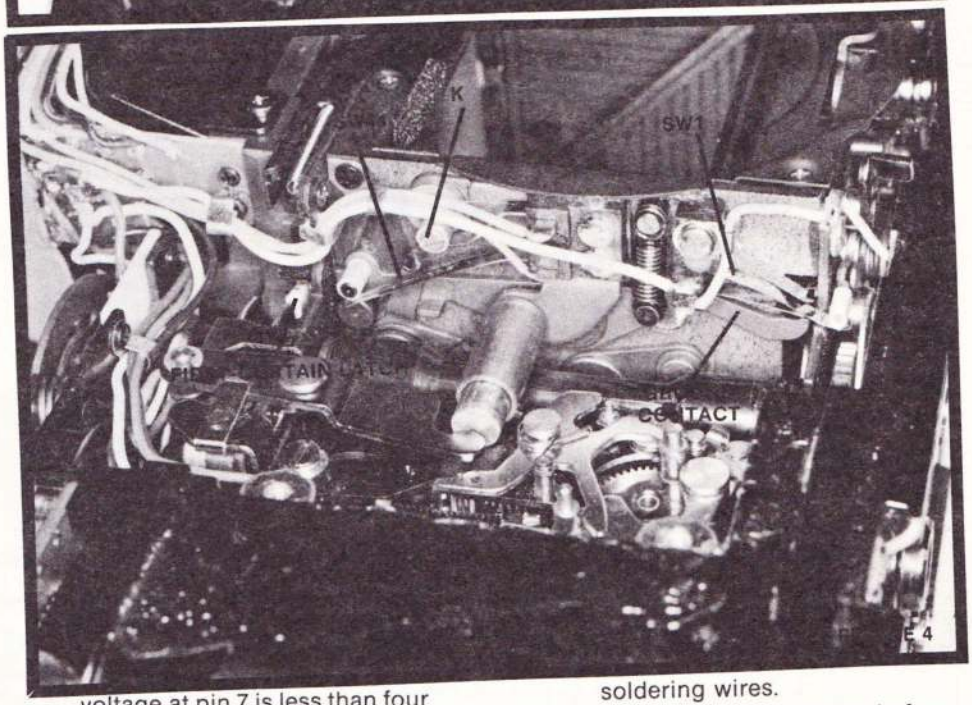
Curtain positions: There should be a space gap of 0.1 to 0.3mm between the two curtain bars with the shutter cocked, Fig. 6. Adjust by moving the screw on the first-curtain winding roller to a different hole.

X-sync: Adjust by reforming the sync contacts or by retiming the first-curtain gear, Fig. 2.

ADJUSTMENTS NOT NORMALLY REQUIRED:

1. Constant voltage. Adjust for 2.8V measured to the blue wire, Fig. 7.
2. 540mv. Adjust for 540mv measured to the green wire, Fig. 7.
3. LED input voltage. Measure the voltage between negative battery and pin 7 of the IC on the switch-amp board, Fig. 1. Compare this reading with the voltage measured between pin 8 of the same IC and positive battery. Adjust so that the voltage at pin 7 is less than four times the voltage at pin 8.
4. Offset. Disconnect the purple wire which connects to pin 6 of the amplifier IC, Fig. 13. Connect fixed resistors as shown. Adjust so that the voltage at pin 7 is 7mv higher than the voltage at pin 6 (voltage at pin 7 = voltage at pin 6 +7mv).





DISASSEMBLY HIGHLIGHTS:

Control positions: unimportant

Precautions:

1. Remove the battery before unsoldering wires.
2. Note wire color codes before unsoldering. Color codes may vary.
3. The caps over the film-speed dial, wind lever, and self-timer lever are cemented in place; use acetone or M.E.K. Also, the front leatherette sections have metal backing plates which can be difficult to remove without damage. Remove the leatherette sections first. Then apply solvent to remove the metal backing plates. If you do damage the plates, the leatherette sections won't lie flat. Order replacements: right-side leather supporting

plate — 131105
left-side leather supporting plate — 131104

Sequence:

1. top cover — wind lever, film-speed dial, rewind knob (compression spring for rewind clutch will be loose), shutter-speed dial. Loose parts as you lift off top cover: release pin, release button, battery-test button.
2. bottom cover
3. tripod-socket plate (to reach SW7)
4. self-timer lever
5. right and left front leatherette and metal backing plates
6. 4 front-plate screws
7. lift aside front plate to reach mirror-box switches

Note: To remove the front plate completely, unsolder the diaphragm-resistor wires (green, white, orange) from the rewind-side terminal board, Fig. 10. Also unsolder all but the two red wires (exposure-preview switch) from the lens-mount terminal board, Fig. 9.

Sequence to remove mirror-box/shutter assembly:

1. blue wire from main-amp board (the blue wire that goes to the film-speed resistor)
2. gray wire from rewind-side terminal board
3. wires from wind-side terminal board: green (film-speed resistor), red (release switch), white (battery-test board), blue (self-timer switch)
4. free wires from wire clamp under film-speed assembly
5. film-speed assembly (3 screws)
6. wires from lower terminal board: SW7 (red, pink, blue), violet SW1 wire, black wires from release magnet
7. eyelens
8. speed-selector detent assembly (2 screws and spring)
9. E-ring, top of rewind shaft
10. retaining ring and speed selector
11. 3 screws holding switch-amp board
12. shutter-speed brush
13. 2 post screws holding LED board
14. slide LED board toward rewind end of camera until LED display clears mirror-box slot
15. shutter-speed pointer lever and spring (under LED board)
16. free wires from wire clamp, underside of shutter, rewind side
17. self timer (2 screws)
18. first-curtain brake (in later models, bottom of camera above first-curtain gear)
19. 4 screws, back of focal-plane aperture (under porous-plastic light-trap strips)
20. lift out mirror-box/shutter assembly from top of camera

REASSEMBLY HIGHLIGHTS:

1. Before replacing the mirror-box/shutter assembly, turn the power-winder coupler at the bottom of the camera to position the charge cam as shown in Fig. 14 (straight side of cam aligned with edge of body casting). Also charge both the shutter and the mirror box.

Note: To cock the shutter and mirror box, rotate the shutter-charge gear, Fig. 5, in a clockwise direction (as seen from the bottom) until the curtains latch half way across the focal-plane aperture. Then

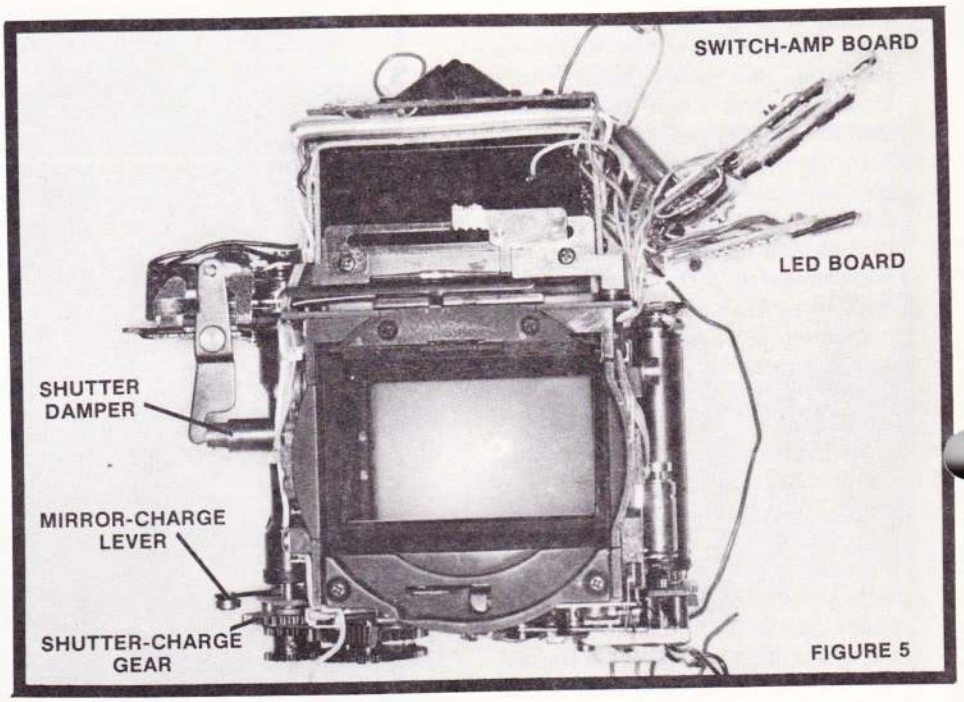


FIGURE 5

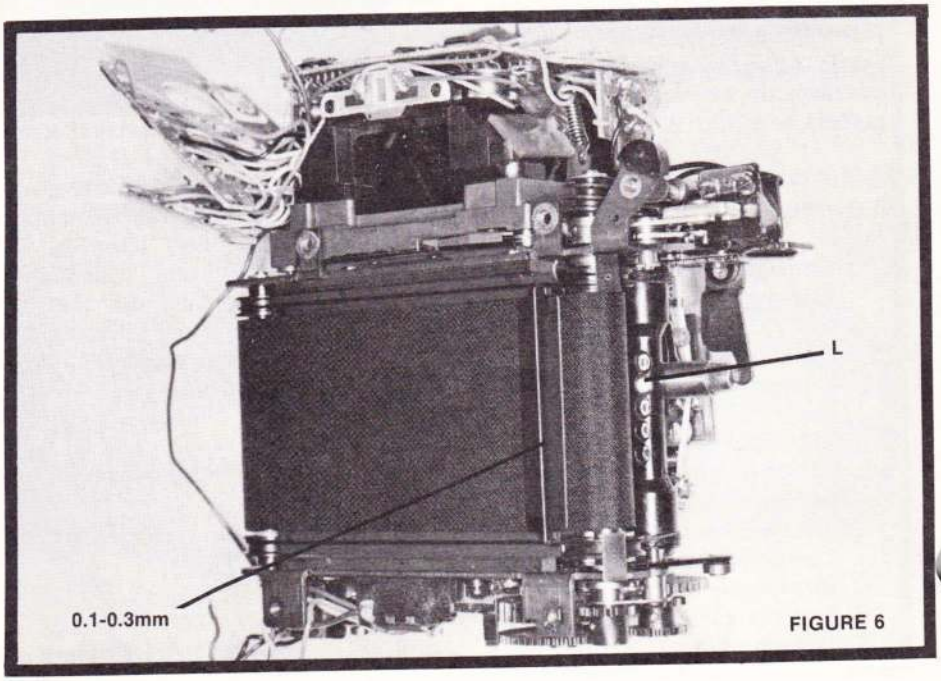


FIGURE 6

FIGURE 8 SWITCH-AMP BOARD

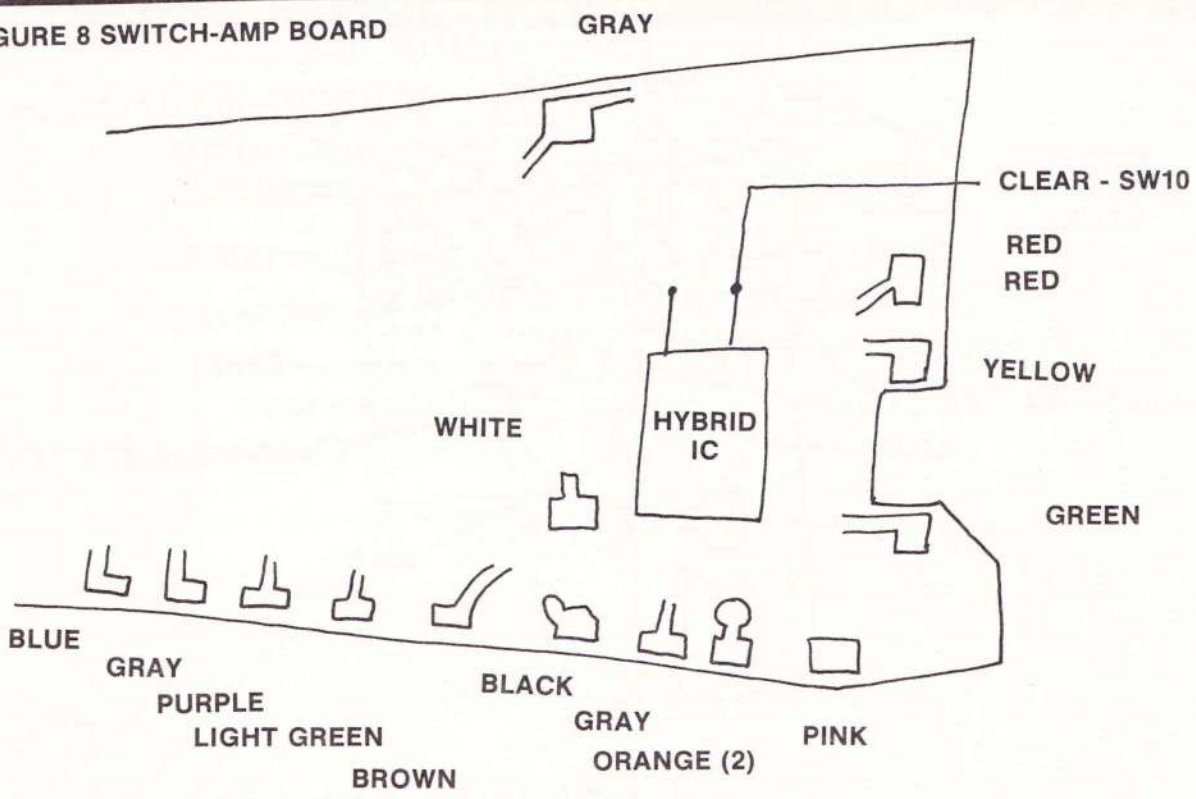
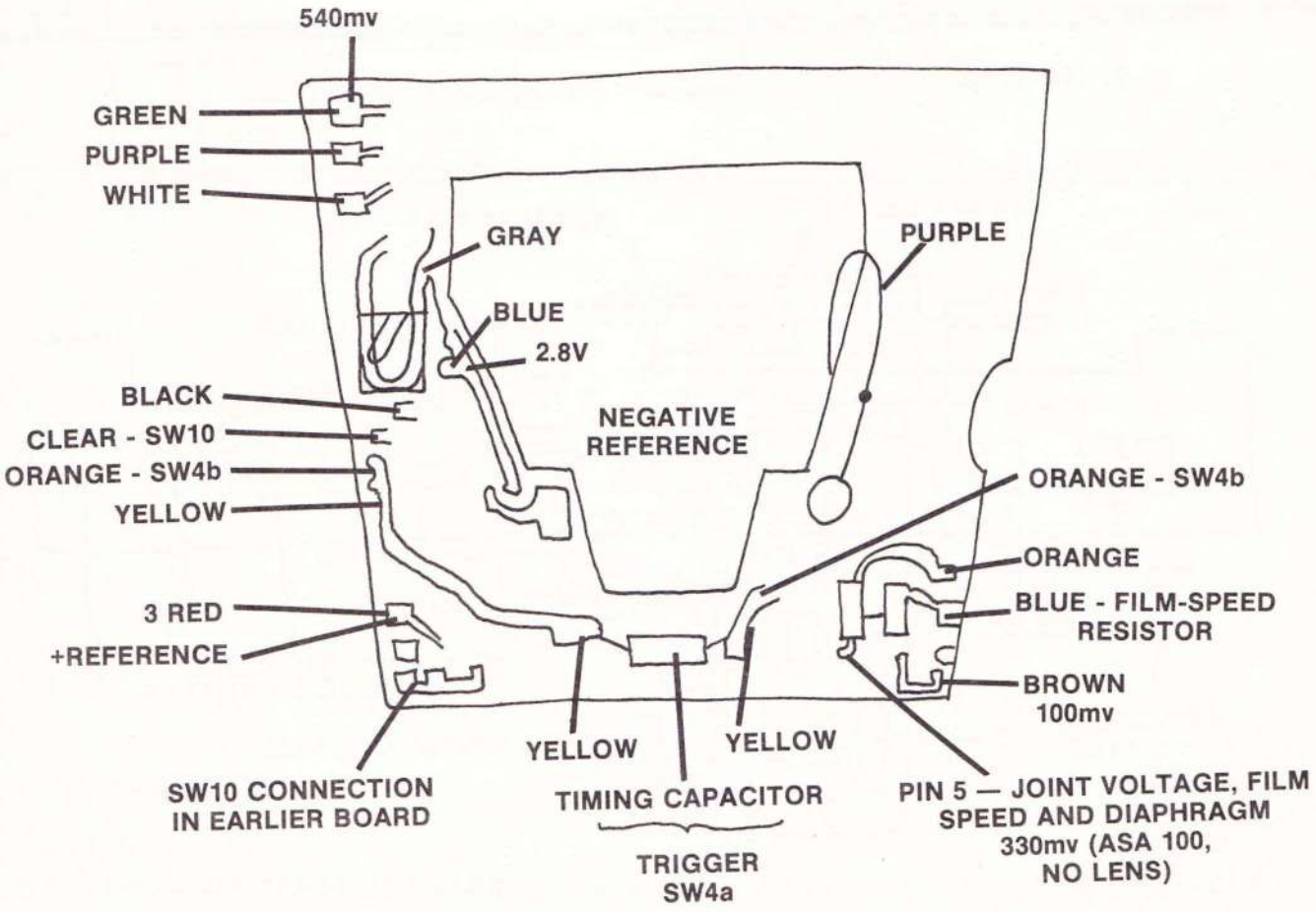


FIGURE 7 MAIN-AMP BOARD (REVISED)



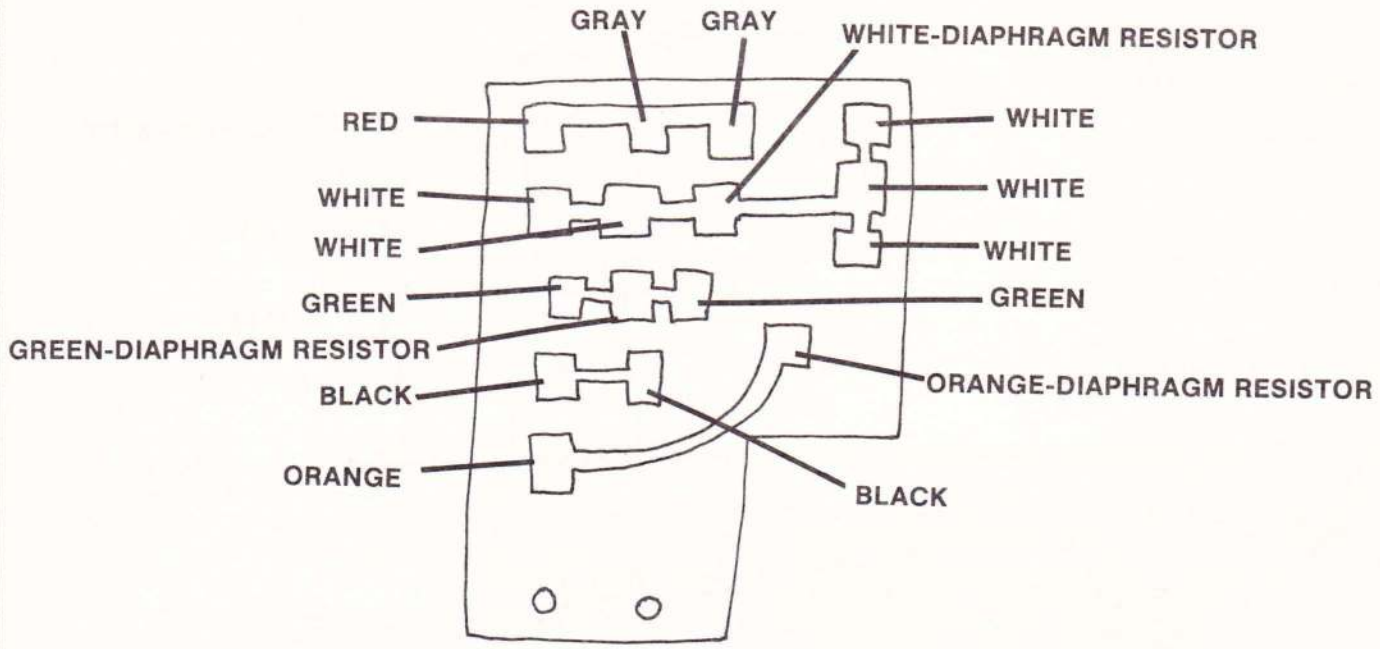


FIGURE 10 REWIND-SIDE TERMINAL BOARD

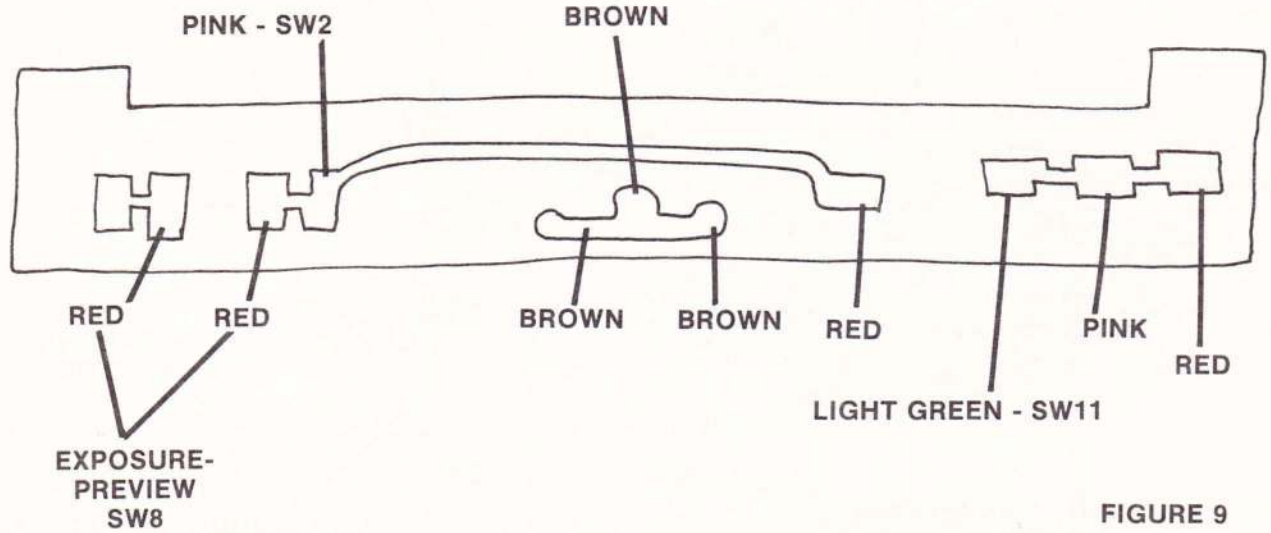


FIGURE 9

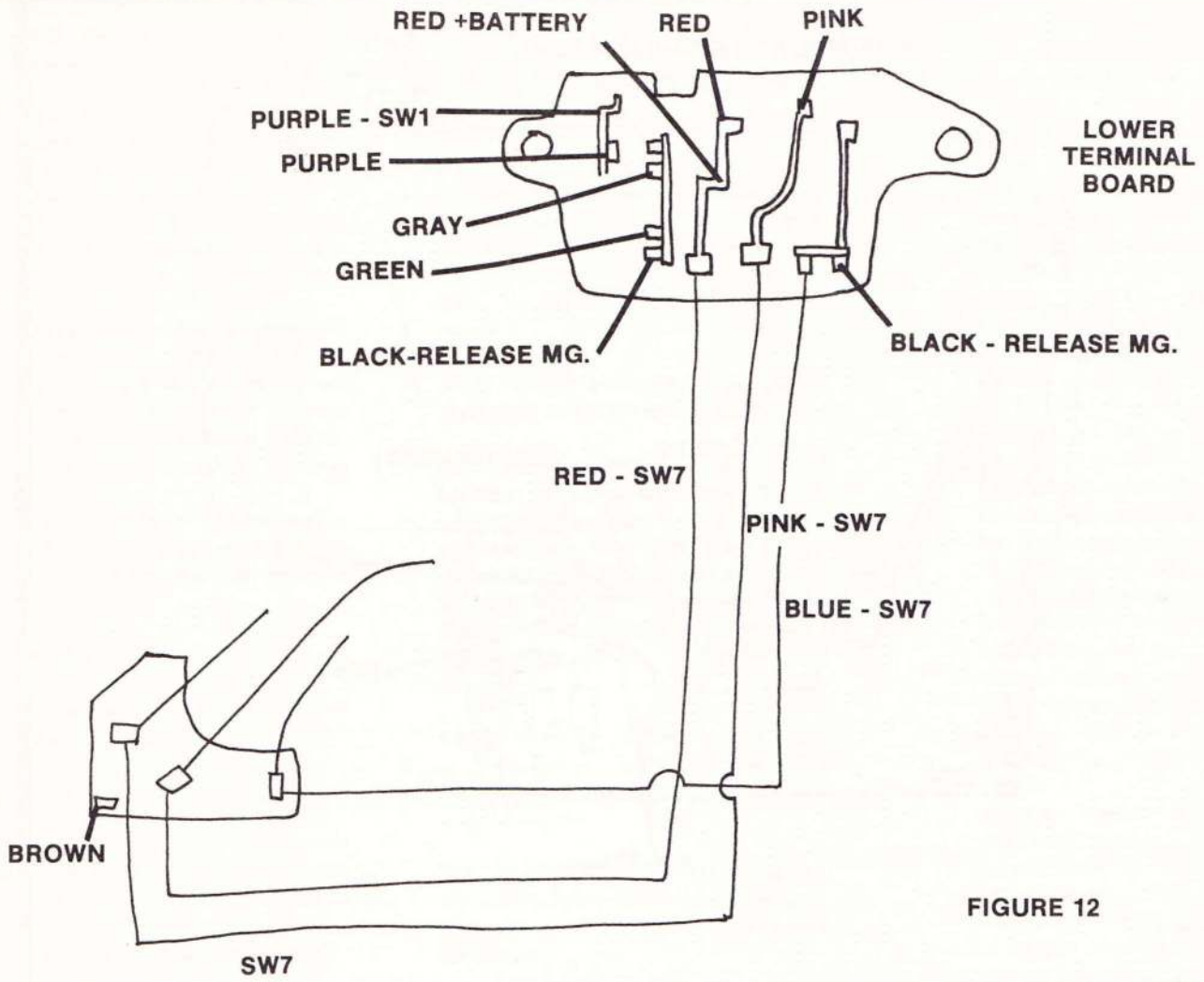


FIGURE 12

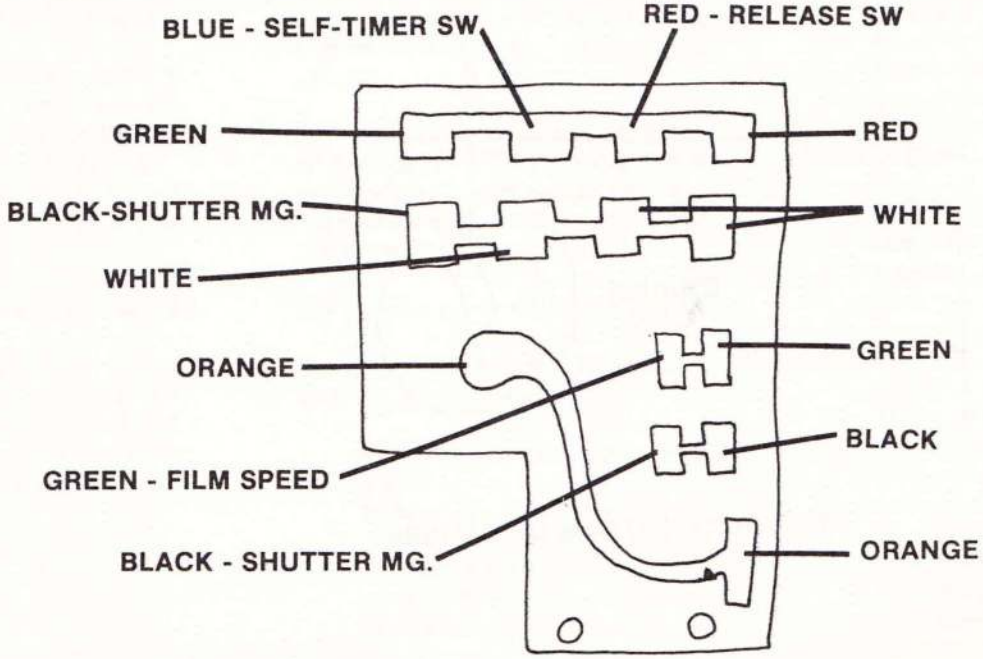


FIGURE 11 WIND-SIDE TERMINAL BOARD

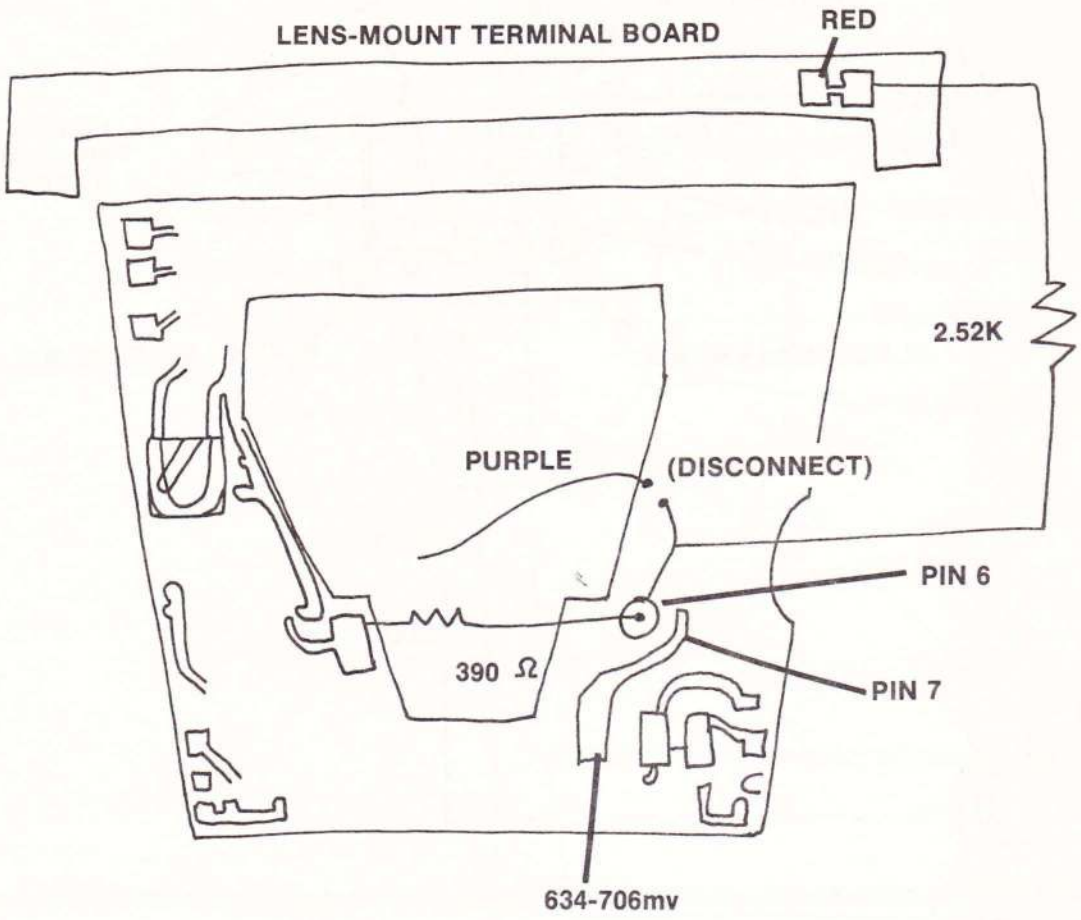


FIGURE 13

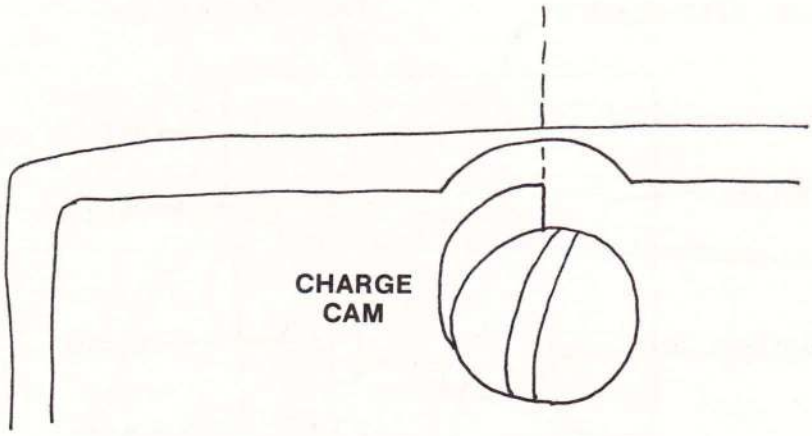


FIGURE 14 BOTTOM OF CAMERA

push the mirror-charge lever to charge the mirror. Finally, turn the shutter-charge gear to complete the wind cycle. To release the mirror, push the armature of the mirror-release magnet against the core.

2. After installing the LED board, shift its position to align the shutter-speed scale in the finder.
3. Make sure the pin on the pointer lever rides against the outer edge of the shutter-speed brush. If the green pointer doesn't align with the calibrations, you can bend the follower pin.
4. Cock the shutter before replacing the tripod-socket plate; the X-contact closing lever remains on the plate.

TROUBLESHOOTING:

Behavior without battery: shutter will not release, no LEDs

Typical battery drain (5V supplied to battery terminals):

LEDs:	44ma
Shutter open (bulb):	54ma
Battery test:	50ma

Problems related to circuit boards:

Switch-amp board — the meter readout works, but the shutter does not work

LED board — the shutter works, but the meter readout does not work

Main-amp board — neither the meter readout nor the shutter works.

However, before replacing a board, try retouching the solder connections.

Functions and positions of switches:

SW1. Timing switch for power winder, wind side of mirror box. Connects power-winder pins 2 and 3 together with shutter released. Connects release magnet to ground with shutter cocked.

SW2. Battery-test switch, top of camera, wind side.

SW3. Release switch, bottom of film-speed assembly.

SW4a. Trigger switch, wind side of mirror box. Closed with shutter cocked, opens as first curtain starts to move to begin timing cycle.

SW4b. LED switch, rewind side of mirror box. Closed with shutter released, to provide power to metering circuit. Open with shutter cocked. The closed trigger switch (in parallel with SW4b) now provides power to the metering circuit.

SW5. X-sync contacts at bottom of camera.

SW6. Auto-manual-bulb selector, underside of switch-amp board.

SW7. Power switch at bottom of camera. With the mirror down, the center contact (red wire) comes against the blue-wire contact to connect the release magnet to ground. With the mirror up, the center contact comes against the pink-wire contact to provide power to the circuit.

SW8. Exposure-preview switch, back of front plate. Turns on the LED display, but has no effect on the shutter action.

SW9. Self-timer switch at the back of the self-timer mechanism. Closes at the end of the self-timer delay to release the mirror.

SW10. Memory switch, bottom front of mirror box, rewind side. Closed with the mirror down, open with the mirror up to lock in the exposure.

SW11. Mirror-up switch, rewind side of mirror box. Closes as the mirror reaches the up position to switch in the manual-speed circuit and turn off the LEDs.

SW12. Safety switch for hot shoe.

Troubleshooting steps for specific symptoms:

1. Mirror does not release, LEDs work
   Release switch SW3
   Check by shorting between the top two lands of the wind-side terminal board, Fig. 11 (release switch to ground). If the shutter then releases, check the release switch and the wiring. To clean the release switch, remove the film-speed assembly.
   Release magnet
   Apply 2.1V between the two black wires, Fig. 12; the shutter should release. Approximate resistance of coil measured between two black wires: 21.5 ohms.
   SW1, poor contact
   Check the continuity between the white-wire land on the wind-side terminal board and the camera body. You should get direct continuity with the shutter cocked. No continuity — reform the ground contact of SW1, Fig. 4, and clean the contact surfaces.
   SW7, poor contact
   Check the continuity between the blue wire and the red wire at the lower terminal board, Fig. 12. You should measure direct continuity with the mirror down. No continuity — reform and/or clean SW7, Fig. 2.
   (Diode shorted, underside of lower terminal board.)
2. LED indication doesn't change, auto shutter delivers only one speed
   Memory switch SW10, poor contact or solder
   Check between the two SW10 wires (clear insulation, black in some models). One wire connects to the switch-amp board, the other to the main-amp board. You should measure direct continuity with the mirror down.
3. Erratic auto speeds, LED skips up and down during exposure.
   Memory switch SW10, chattering
   Clean or replace the memory switch (part #131480)
4. Both curtains run together, all speeds
   SW7, poor contact
   Check between the red wire and the pink wire at the lower terminal board, Fig. 12. You should get direct continuity with the mirror up. Clean and/or reform the pink-wire and red-wire contacts of SW7, Fig. 12.
   Shutter magnet
   Apply 2.5V between the two black magnet wires at the wind-side terminal board; the shutter magnet should then hold open the shutter. Approximate resistance of coil measured between the two black wires — 368K.
5. Both curtains run together,

speeds of 1/60 through 1/2000
Trigger switch SW4a, poor contact
Check the continuity between the two yellow wires to the main-amp board, Fig. 7. You should get direct continuity with the shutter cocked, no continuity with the shutter released.

6. Fast speed only on manual, LEDs and auto o.k.
Mirror-up switch SW11, poor contact
Check the continuity between the light-green wire at the switch-amp board and the light-green wire at the lens-mount terminal board. You should get direct continuity with the mirror up.
7. LED indication remains at A with the shutter released, works with the shutter cocked
SW4b, poor contact
Check the continuity between the orange wires at the main-amp board, Fig. 7. You should measure direct continuity with the shutter released.
8. Shutter hangs open on auto, LED moves to B during exposure
Memory switch SW10, shorted to ground
Check to see if an uninsulated portion of the lag lever comes against the memory switch, Fig. 3. If necessary, reform the long contact of the memory switch.
9. LED skips up and down as you change film-speed or diaphragm-setting — or LED does not change when you change the aperture setting in bright light
Diaphragm resistor or film-speed resistor, poor contact
Check both resistors by measuring the voltage at pin 5 of the amplifier, Fig. 7. The voltage should decrease as you turn the diaphragm-coupling ring clockwise and as you set faster film speeds.
10. Mirror sticks part way up (more likely with lens installed)
Mirror-damping air cylinder, dirty
Check for smooth operation by lifting and lowering the mirror with your finger. Clean the cylinder and lubricate with shutter oil.
Light-trap material at top of mirror, out of position
Lag lever, Fig. 3 — binding
11. Shutter does not advance with power winder
Check the continuity between pins 2 and 3 of the power-winder contact assembly, Fig. 2. You should get direct continuity with the shutter released. No continuity — SW1 is not making good contact (white-wire contact to purple-wire contact).
12. Power winder does not release shutter
Short power-winder terminal #1, Fig. 2, to ground; the shutter should release. If not, check the solder connections.
13. Mechanical jam
Check to see if the first curtain is in the charged position and the second curtain is in the released position. If so, disengage the first curtain by pushing the first-curtain latch, Fig. 4. Attempting to charge the shutter without first disengaging the first curtain could damage the gears.
14. No LEDs when you push the exposure-preview button, but the LED flashes on when you release the shutter
Exposure-preview switch SW8, poor contact
Short between the two red wires on the lens-mount terminal board to SW8, Fig. 9. If the short turns on the LED display, remove the front plate to clean SW8.

Tips for troubleshooting without disassembly:

1. If the shutter does not release when you push the release button — but does release at the end of the self-timer delay — the release switch is not making good contact. If the shutter does not release at the end of the self-timer delay — but does release when you push the release button — the self-timer switch is not making good contact.
2. Check the mirror-up switch SW11 by manually raising the mirror with the mirror lock-up lever. At a manual shutter speed, the LED display should not turn on when you push the exposure-preview button. If it does, SW11 is not making good contact.
3. It's sometimes possible to diagnose the problem by watching the LED display. The LED display should indicate the proper shutter speed when you push in the exposure-preview button. Also, when you release the shutter, the LED display should flash on to indicate the same speed which was shown by the exposure preview.
   a. LED indicates a different speed when you release the shutter from that shown during the exposure preview — memory time lag too short (reform the long contact of SW10 so that the switch opens later).
   b. LED does not display when you release the shutter, but the auto speed is o.k. — delay between closing of power switch SW7 and closing of mirror-up switch SW11 too short (bend the short contact of SW11 away from the long contact to increase the delay).
   c. LED skips up and down when you release the shutter — chattering in the memory switch SW10.
   d. LED displays B when you release the shutter, and the auto shutter speed is very long at low-light levels — chattering of power switch SW7.
   e. LED indication skips up and down when you change the film-speed setting — poor contact in the film-speed resistor or loose film-speed base plate.
   f. LED preview o.k., but no display when you release the shutter — SW7, poor contact.
   g. LED indication does not change when you change the aperture in bright light — diaphragm resistor, poor contact.
   h. In low light, LED display shows only B indication — memory switch, poor contact or solder connections.
   i. No change in LED indication above 1/30 — poor contact in film-speed or diaphragm resistor.

REVISED PARTS:

1. Circuit boards. You can identify the revised boards by a red-colored edge. The revised boards will work in the earlier cameras, but the earlier boards will not work in the later cameras. Also note variations in wiring.

2. Charge-cam assembly revised to add first-curtain brake, bottom of camera.
3. X-sync contacts (part of SW7 assembly) revised to correct erratic sync operation.

OTHER COMMENTS:

1. You can clean the focusing screen and the condenser lens without removing the top cover. Disengage the latch at the top front of the mirror box to drop out the focusing screen; remove the two screws at the top front of the mirror box to remove the condenser. When cleaning the underside of the pentaprism through the lens opening, be careful to avoid damaging the green shutter-speed pointer.
2. The circuit boards come only as complete units.
   Switching amplifier base assembly — 131B02
   Indicator needle base assembly (LED board) — 131B03
   Main amplifier base assembly — 131B01
3. New curtains come already mounted to the rollers.
4. If the shutter jams, excessive force may break the first-curtain pinion (131336) or the second-curtain pinion (131337). Spring pins hold the pinions to the winding-rollers shafts. Each pinion has a single "pick-up" tooth; the pick-up teeth must face the cutout section of the wind gear (under the first-curtain gear, Fig. 2).

Classified

FOR SALE: National Camera Mark IV motion analyzer. Helen Myers, Rt. 2, Box 1919, Madras, Ore. 97741. Phone 1-503-475-2912.

FOR SALE:

Motion Analyzer IV A	295.00
Light Meter Tester homemade	20.00
EMC Ultrasonic Cleaner (fair)	15.00
Aerotronic Shutter Tester (as is)	25.00
Heathkit Audio Oscillator	25.00
Eico Signal Generator	25.00
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Heathkit Condensor Checker	20.00
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Heathkit Audio Wallmeter	10.00
Micronto Dynamic Transistor Checker	15.00
MTC Data View (microfiche reader)	35.00
Heathkit Q Multiplier HD11	15.00

$450.00 for all of above

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